TECHNICAL REVIEW DOCUMENT
For
October 1, 2012 RENEWAL OF OPERATING PERMIT 95OPCY048

Colorado Interstate Gas Company, LLC
Cheyenne County
Source ID 0170001

Prepared by Blue Parish
July – August, 2009
Revised December 2009 & November 2011 to include discussion of Regulation No. 7, Section XVII.E Offramp Demonstration & NESHAP Standards for Engines Less than 500 horsepower at Major HAP Sources

I. Purpose

This document establishes the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewed Operating Permit for the Colorado Interstate Gas Company, LLC (CIG) - Kit Carson Compressor Station. The current Operating Permit for this facility was first issued on February 1, 1998, was renewed on August 1, 2003, was last revised on March 13, 2007 and expired on August 1, 2008. However, since a timely and complete renewal application was submitted, under Colorado Regulation No. 3, Part C, Section IV.C all of the terms and conditions of the existing permit shall not expire until the renewal operating permit is issued and any previously extended permit shield continues in full force and operation.

This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the source's renewal application submitted on June 29, 2007, additional information submitted on August 4, 2009 and November 10, 2011, comments on the draft permit submitted on September 30, 2009 and November 12, 2009, previous inspection reports and various e-mail correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at http://www.colorado.gov/cs/Satellite/CDPHE-AP/CBON/1251596446069. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Source

This facility consists of ten (10) main line compressor engines, natural gas-fired, used to pressurize pipeline quality gas to specification prior to transmission to sales pipelines. The compressor load varies from idle to all ten engines operating. In addition, there are three natural gas powered electric generators and one emergency generator. The emergency generator may move from this facility to another CIG facility (Springfield Compressor Station, Operating Permit No. 95OPPR074, Facility ID 0990003) as necessary. Kit Carson is a compressor station exclusively. There is no gas processing or gas treatment done at this location.

The facility is located in Cheyenne County, CO approximately 7.5 miles south of the Town of Kit Carson on US Highway 287. The area in which the facility operates is designated as attainment for all criteria pollutants. Kansas, an affected state, is within a 50 mile radius of the facility. There are no Federal Class I designated areas within 100 kilometers of the facility.

This facility is categorized as a major stationary source (Potential to Emit $\geq$ 250 Tons/Year for CO and NOx). This facility is also categorized as a major source of Hazardous Air Pollutants (individual HAP $\geq$ 10 tons/year and/or total HAP $\geq$ 25 tons/year).

Emissions (in tons/yr) at the facility are as follows:

Pollutant	**Potential to Emit**
NOx	1,708.2
CO	367.3
VOC	61.8
Highest HAP (formaldehyde)	28.8
Total HAP	38.3

Potential to emit is based on the operating permit emission factors (modified as described later in this document) and the maximum natural gas use for each engine as stated in the application. The source does not report actual emissions different than potential emissions. Details on the emissions calculations for each engine are included in Attachment 1.

The Division inspected the Kit Carson Compressor Station on August 6, 2008 and November 11, 2009 and reported the source to be in compliance with the Operating Permit requirements (Inspection Reports dated August 20, 2008 & December 16, 2009).

Applicable Requirements

40 CFR 63 Subpart ZZZZ (RICE MACT)

Note that the Clark engines are being re-classified as two stroke lean burn engines as a part of this renewal, and the Ingersol-Rand engines are being reclassified as four stroke rich burn engines. The Caterpillar engine remains classified as a four stroke lean burn engine. See further discussion under Source Requested Modifications in Section III for details.

Reciprocating Internal Combustion Engines (RICE) that are greater than 500 horsepower, located at a major source of HAP emissions, and commenced construction or reconstruction before December 19, 2002 are classified as existing sources under Subpart ZZZZ. All of the Clark engines at the facility (units E001 – E010) are greater than 500 horsepower and were started up in 1954 or earlier. Existing RICE at major HAP sources that are two stroke lean burn and greater 500 horsepower do not have any requirements under Subpart ZZZZ or 40 CFR 63 Subpart A, and are not required to submit initial notifications (40 CFR 63.6590(b)(3)(i)).

RICE that are less than 500 horsepower, located at a major source of HAP emissions, and commenced construction or reconstruction on or before June 12, 2006 are also classified as existing sources under Subpart ZZZZ. The Ingersoll Rand engines (units E011 – E013) are less than 500 horsepower and were started up in 1949. The Caterpillar engine (E014) is also less than 500 horsepower and was started up in 1994.

Engines E011 – E013 are classified as non-emergency existing engines less than 500 hp at major HAP sources are therefore subject to emission standards under Subpart ZZZZ. These units are also subject to initial performance tests and are required to submit a petition to the EPA Administrator requesting operating limitations to be established during the initial performance test and continuously monitored thereafter; or for approval of no operating limitations. At the time of permit issuance, the petition approval had not yet been received by the source. Subsequent performance tests are not required on a regular basis, but are required when the catalysts (if present) are changed.

Engine E014 is classified as an emergency existing engines less than 500 hp at major stationary source. This unit is subject to work practice requirements (regularly scheduled oil/filter changes and spark plug and belts/hoses inspections) under Subpart ZZZZ.

The compliance date for the Subpart ZZZZ requirements for Engines E010 – E013 and E014 is October 19, 2013. CIG submitted an initial notification to the Division in January, 2011. Note that Colorado has not yet adopted the amendments to Subpart ZZZZ that address engines less than 500 horsepower at major sources of HAP; therefore these requirements are currently federal-only enforceable.

<u>40 CFR 60 Subpart JJJJ (RICE NSPS)</u>

New Source Performance Standards apply to RICE that commence construction, modification or reconstruction after June 12, 2006 under Subpart JJJJ. As stated above, all engines at the facility have been in operation since 1994 or earlier; therefore Subpart JJJJ requirements are not applicable.

<u>Regulation No. 7, Section XVII</u>

Colorado Regulation No. 7, Section XVII.E includes included provisions to exempt existing (constructed or modified before February 1, 2009) lean burn engines from control requirements if their owners and operators could demonstrate that the cost of controls would exceed $ 5,000 per ton and that such demonstration must be submitted by August 1, 2009. The source submitted a request for such an exemption on July 30, 2009 and in a December 21, 2009 letter, the Division agreed that the exemption applied to engines E001 through E010. Engines E011 through E013 and E014 are not subject to the control requirements because they are each less than 500 horsepower. *See further discussion under Source Requested Modifications in Section III for details on the reclassification of engines.*

40 CFR 63 Subpart HHH (Natural Gas Transmission and Storage Facilities MACT)

As described in previous technical review documents, the facility is a natural gas transmission and storage facility, and is a major source of HAPs. However, no glycol dehydrators exist at the facility and therefore no requirements apply under Subpart HHH.

III. Discussion of Modifications Made

Source Requested Modifications

The renewal application received on June 29, 2007 requested the following modifications:

- Update the facility contact person and responsible official information
- Change the designation of the engines E001 – E010 from “2-cycle rich burn” to “2-Cycle lean burn”
- Change the designation of the engines E011 – E013 from “2-cycle rich burn” to “4-Cycle Rich Burn”
- Update the compliance emission factor for Units E001 – E007 based on the appropriate AP-42 emission factors for 2-stroke lean burn engines
- Update the compliance emission factor for Units E008 – E010 based on the appropriate AP-42 emission factors for 2-stroke lean burn engines
- Update the compliance emission factor for Units E011 – E013 based on the appropriate AP-42 emission factors for 4-stroke rich burn engines

The source also requested in an email received on August 4, 2009 that the compliance emission factors in the permit remain in units of lb/MMscf, and that the appropriate AP-42 factors (which are in units of lb/MMBtu) be converted based on the AP-42 default heat value of natural gas of 1020 Btu/scf. Note that in the previous issuance of the permit, emission factors incorporated a natural gas heating value of 1,048 Btu/scf for all engines except the Caterpillar (E014), which is based on 1,020 Btu/scf.

Therefore, the modified emission factors for engines at Kit Carson Compressor Station are:

Engine(s)	Type	NOx	CO	VOC
E001 through E007 & E008 – E010	2-Cycle Lean Burn	3.17 lb/MMBtu 3,233 lb/MMscf	0.386 lb/MMBtu 394 lb/MMscf	0.12 lb/MMBtu 122 lb/MMscf
E011 – E013	4-Cycle Rich Burn	2.27 lb/MMBtu 2,315 lb/MMscf	3.72 lb/MMBtu 3,794 lb/MMscf	0.0296 lb/MMBtu 30 lb/MMScf
E014 (see note)	4-Cycle Lean Burn	19.4 g/hp-hr 5,708.9 lb/MMscf	*0.557 lb/MMbtu* *568 lb/MMscf*	*0.118 lb/MMbtu* *120 lb/MMscf*

The NOx emission factor for E014 is the manufacturer's value; all others are based on AP-42 (July, 2000). Emissions of CO and VOC at the permitted fuel use rate for E014 are below two tons per year each, therefore the permit does not include limits for CO and VOC for engine E014.

Engines E001 – E010 were previously identified as rich burn engines. The source requested that the designation be changed from rich burn to lean burn to accurately reflect the true operation of the engines. The source then submitted a cost analysis on August 3, 2009 to apply for the offramp under Regulation No. 7, Section XVII.E.3 (which allows existing lean burn engines to avoid installation of controls where costs are in excess of $5000 per ton). The Division has worked with CIG to obtain information to confirm that the engines are, and have always been, lean burn engines and not rich burn engines. The term "rich burn," as initially applied to these units, probably resulted from the fact that these engines were originally installed without turbochargers and therefore operated richer than a typical unit (but still within the definition of "lean burn" that as per Regulation No. 7) . The manufacturer provided CIG with a letter on November 1, 2011 stating that the engines "were not designed to safely operate with oxygen levels below 2% and would therefore not be defined in the industry as a rich burn engine." Therefore, the Division will not require any additional monitoring or testing requirements in order to re-classify the engines in this permit issuance.

In an email correspondence sent July 25, 2012, the source requested the addition of an option to allow the use of alternative monitoring to demonstrate continuous compliance with formaldehyde emission limits for engines E011 – E013 for NESHAP ZZZZ purposes. The source stated that they were in the process of trying to obtain approval for an alternative monitoring approach from the EPA. These engines do not currently have any monitoring requirements, and the alternative monitoring approach sought by the source is to demonstrate compliance with formaldehyde exhaust concentration limits for the engines. A petition to establish operating limitations for the initial performance test, and continuously monitored thereafter, is required for these engines according to 40 CFR 60 Subpart ZZZ §63.6620(f), since these engines have formaldehyde emission limits but no control device. As of the issuance date of the operating permit renewal, the source had not yet received approval of the petition submitted. Conditions were added to the permit, as detailed below, referencing the petition requirement and the use of requirements resulting from the petition for compliance demonstration.

The source's requested modifications were addressed as follows:

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- Revised the facility mailing address, responsible official and permit contact information in accordance with information submitted in the renewal application and subsequent correspondence with the source permit contact.

Section I – General Activities and Summary

- Condition 6.1, Summary of emission Units: revised the description of emission units E001 – E010 from "2-cycle rich burn" to "2-cycle lean burn." As noted in the previous technical review document, the Division could not locate emission factors or data for 2-cycle rich burn engines and allowed the use of the highest of the AP-42 factors for each pollutant from either 2-stroke lean burn engines (NOx and VOC) or 4-stroke rich burn engines (CO). As a result of the change in designation, the applicant is also requesting that the compliance emission factors be revised to 2-stroke lean burn factors for all pollutants.

  Condition 6.1, Summary of Emission Units: revised the description of emission units E011- E013 from "2-cycle rich burn" to "4-cycle rich burn." As a result of the change in designation, the applicant is also requesting that the compliance emission factors be revised to 4-stroke rich burn factors for all pollutants.

  Note that there are no requirements in the RICE MACT, the RICE NSPS or Colorado regulations that apply specifically to "2-cycle rich burn" engines; therefore the change in designation will not result in any previously applicable requirements becoming non-applicable. Additionally, the Division does not consider the re-designation of these engines to be a modification as per Regulation No. 3, Part A, I.B.26 because it is not a physical change or a change in the method of operation; the engines remain grandfathered from Colorado Regulation No 3, Part B and Part D construction permitting requirements.

Section II – Specific Permit Terms

- Condition1.1 & 2.1 – Updated the compliance emission factors to July 2000 AP-42 emission factors for 2-stroke lean burn engines as described above. AP-42 emission factors are provided with units of lb/MMBtu. To convert the AP-42 emission factors to units of lb/MMscf, they are multiplied by the heat value of the natural gas, which is based on the AP-42 default value of 1,020 btu/scf (the previously issued permit used a value of 1,020 btu/scf).

- Condition 3.1 – Updated the compliance emission factors to July 2000 AP-42 emission factors for 4-stroke rich burn engines as described above. The emission factors were also updated to reference the AP-42 default natural gas heating value of 1,020 btu/scf.

- Condition 5.1.5 – This condition was added to reference the petition to the Administrator required for Engines E011 – E013. The petition is to establish operating limitations for the initial performance test that will be continuously monitored thereafter; it is required because these engines have formaldehyde limits under NESHAP ZZZZ but do not have control devices. The condition also requires Division notification of the requirements resulting from the petition.

- Condition 5.1.13 – This condition was added to require that continuous compliance with the formaldehyde emission limit for engines E011 – E013 be demonstrated according to the results of the EPA petition required by Condition 5.1.5; and that records be kept to demonstrate that any parameters proposed as operating limitations are being monitored and recorded according to the results of the petition.

Other Modifications

In addition to the source requested modifications, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments to the Tri-State Limon Generating Station Operating Permit. These changes are as follows:

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- It should be noted that the monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).

- Modified the language concerning postmarked dates for report submittals to reflect the Division's current standard language.

Section I – General Activities and Summary

- Revised the language in Condition 1.4 include current conditions that are state-only enforceable.

Section II – Specific Permit Terms

- Added the 40 CFR 63 Subpart ZZZZ requirements as a new Condition 5.

Section IV – General Permit Conditions

- Updated the general permit conditions to the current version (11/16/2010).

Appendices

- Updated Appendices B and C (Monitoring and Permit Deviation Reports and Compliance Certification Reports) to the newest versions and to reflect changes to the unit descriptions (2/20/2007).

- Cleared the list of modifications from Appendix F related to the previous issuance.

IV. Public Notice

The public notice period for this Renewal #2 was from February 2, 2012 to March 3, 2012. The source submitted comments, requesting that the permit and the TRD be updated to reflect the recently changed company name. The company name was previously Colorado Interstate Gas Co, the new name is Colorado Interstate Gas Company, LLC. The source submitted an APEN received April 18, 2012 to reflect the name change. The permit and TRD documents have been updated accordingly.

ATTACHMENT 1: Emission Details for Kit Carson Compressor Station Engines

			Potential Emissions (tpy)			
AIRS ID	**Unit ID**	**Description**	**NOx**	**VOC**	**CO**	**HAPs**
001	E001	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
001	E002	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
001	E003	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
001	E004	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
001	E005	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
001	E006	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
001	E007	Clark BA-6 2SLB RICE (1060 hp)	162.3	6.1	19.8	3.8
002	E008	Clark HBA-6 2SLB Rice (1160 hp)	151.0	5.7	18.4	3.5
002	E009	Clark HBA-6 2SLB Rice (1160 hp)	151.0	5.7	18.4	3.5
002	E010	Clark HBA-6 2SLB Rice (1160 hp)	151.0	5.7	18.4	3.5
003	E011	Ingersol Rand PVG-8 4SRB RICE (326 hp)	35.1	0.5	57.5	0.4
003	E012	Ingersol Rand PVG-8 4SRB RICE (326 hp)	35.1	0.5	57.5	0.4
003	E013	Ingersol Rand PVG-8 4SRB RICE (326 hp)	35.1	0.5	57.5	0.4
004	E014	Caterpillar G3408TA 4SLB RICE (396 hp)	13.7	0.3	1.4	0.2
TOTAL			**1,708.2**	**61.8**	**367.3**	**38.3**

Based on a nominal heat value of:	1,020.0	btu/scf
Max fuel consumption rate of:	100.4	MMscf/yr (Point 001, per engine)
	93.4	MMscf/yr (Point 002, per engine)
	30.3	MMscf/yr (Point 003, per engine)
	4.8	MMscf/yr (Point 004)

Potential Emissions - HAPs (lb/yr)

AIRS ID	UNIT ID	Description	Formaldehyde	Acetaldehyde	Benzene	Acrolein	1,3-Butadiene	TOTAL (tpy)
001	E001	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
001	E002	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
001	E003	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
001	E004	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
001	E005	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
001	E006	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
001	E007	Clark BA-6 2SLB RICE (1060 hp)	5653	795	199	797	84	3.8
002	E008	Clark HBA-6 2SLB RICE (1160 HP)	5259	739	185	741	78	3.5
002	E009	Clark HBA-6 2SLB RICE (1160 HP)	5259	739	185	741	78	3.5
002	E010	Clark HBA-6 2SLB RICE (1160 HP)	5259	739	185	741	78	3.5
003	E011	Ingersol Rand PVG-8 4SRB RICE (326 hp)	634	86	49	81	20	0.4
003	E012	Ingersol Rand PVG-8 4SRB RICE (326 hp)	634	86	49	81	20	0.4
003	E013	Ingersol Rand PVG-8 4SRB RICE (326 hp)	634	86	49	81	20	0.4
004	E014	Caterpillar G3408TA 4SLB RICE (396 hp)	259	41	2	25	1	0.2
TOTAL (tpy)			**28.8**	**4.0**	**1.0**	**4.0**	**0.4**	**38.3**

Note that the reportable threshold for the pollutants shown is 50 lb/year.
Emission factors are based on AP-42, Chapter 3.2 (July 2000)